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**BEFORE THE
SURFACE TRANSPORTATION BOARD**

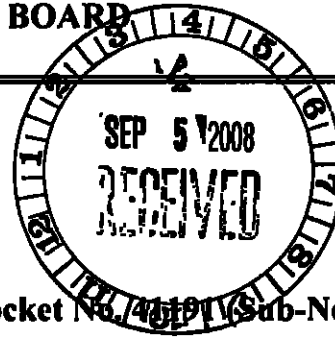
AEP TEXAS NORTH COMPANY

Complainant,

v.

BNSF RAILWAY COMPANY

Defendant.



Docket No. 46191 (Sub-No. 1)

**REPLY FOURTH SUPPLEMENTAL EVIDENCE OF
COMPLAINANT AEP TEXAS NORTH COMPANY
IN RESPONSE TO THE BOARD'S DECISION ON RECONSIDERATION**

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AEP Texas North Company ("AEP Texas") hereby submits its Reply Fourth Supplemental Evidence in accordance with the Board's decision on reconsideration served on May 29, 2008 ("*Reconsideration Decision*"). Herein, AEP Texas responds to the arguments and evidence proffered by Defendant BNSF Railway Company ("BNSF") in its Fourth Supplemental Evidence filed on August 8, 2008 ("*BNSF Opening*").

I. Introduction

In its opening submission in this fourth round of supplemental evidence in this proceeding,¹ AEP Texas demonstrated that when a properly

¹ Opening Fourth Supplemental Evidence of Complainant AEP Texas North Company, August 8, 2008 ("*AEP Texas Opening*")

determined cost of capital is incorporated into the calculation of stand-alone costs (“SAC”) for the hypothetical Texas Northern Railroad (“TNR”) for each of the years at issue, the extensive record in this case compels a finding that the challenged rates are and have been unreasonably high, and that AEP Texas is entitled both to prescriptive rate relief and to reparations. This demonstration was made in compliance with the Board’s *Reconsideration Decision*.

The key determinations to be made at this stage concern the extent to which the Board should apply the Capital Asset Pricing Model (“CAPM”) adopted in *Ex Parte No. 664*² to the determination of the TNR’s capital costs for any years prior to 2006, and the best method by which to project the TNR’s capital costs forward beyond 2006. AEP Texas’ opening submission showed that the correct approach would be to use a CAPM cost of equity to restate the TNR’s capital costs for 1998-2005 period,³ and to use an average of those years together with the CAPM-derived 2006 cost to project future costs. *AEP Texas Opening* at 15-24. At a minimum, AEP Texas showed that consistent with its prior representations to the U.S. Court of Appeals for the District of Columbia Circuit and that court’s

² *Methodology to be Employed in Determining the R R Indus. Cost of Capital*, STB Ex Parte No. 664 (STB served Jan. 17, 2008).

³ In its decision served September 10, 2007 in this proceeding, the Board had calculated capital costs for 1998-2005 using the so-called single-stage Discounted Cash Flow model, which the Board replaced with CAPM in *Ex Parte No. 664*.

subsequent decision in *Western Coal Traffic League v. STB*,⁴ the Board should restate the 2005 TNR cost of capital using CAPM cost of equity, and use the 2005-2006 average cost of equity for future periods. *AEP Texas Opening* at 23-24.

Since either of the foregoing cost of capital scenarios would support findings that the TNR's revenues exceeded costs, AEP Texas followed the Board's directive in the *Reconsideration Decision* and applied the Maximum Markup Methodology ("MMM") to determine the measure of rate relief to which it was entitled. *See AEP Texas Opening* at 40, Table 8.

Not surprisingly, BNSF opposes any correction of previous calculations of the TNR's cost of capital, using the demonstrably superior CAPM approach. However, as shown herein, none of the result-oriented arguments advanced by BNSF has merit

First, contrary to BNSF's assertion, the Board possesses the full legal authority to restate the TNR's cost of capital in this case. The rule against retroactive changes in prescribed rates has no application here, where there has been no final decision as to any element of the rate reasonableness determination, and AEP Texas is not seeking a retrospective change in any prior ruling made by the Board in its "quasi-legislative" capacity. To the contrary, application of the Board's CAPM methodology adopted in *Ex Parte No 664* to this pending case is fully consistent with the court-approved application of other changes in the

⁴ No 07-1064, slip op. at 2-3 (D C Cir. Feb. 1, 2008) ("*WCTL v STB*").

Board's rules governing coal rate reasonableness determinations that were made during the course of this proceeding

Second, and again contrary to BNSF's claims, there is ample evidentiary support for the superiority of CAPM over the discarded single-stage DCF approach. As the Board found in *Ex Parte No. 664*, CAPM has been the preferred methodology for estimating equity costs used by the financial community for many years, and the single-stage DCF approach suffers from a major flaw that consistently produces erroneous results. Before the Court of Appeals, the Board acknowledged that CAPM was adopted because it was more accurate than the single-stage DCF model; the national transportation policy goal of ensuring accurate rail cost information compels its use here.

Finally, there is no basis for BNSF's alarm that a restatement of the TNR's cost of capital using CAPM would undermine railroad investor expectations or disrupt an otherwise orderly regulatory process. As AEP Texas' witness Dr. James Hodder explains, the arguments offered by BNSF and its consultants in support of this charge are exaggerated, and lack foundation in the ample public and administrative records concerning rail industry cost of capital determinations.

The calculations of maximum reasonable rates presented by AEP Texas in this Reply continue to incorporate the TNR cost of capital restatements explained and advanced in *AEP Texas Opening*. Likewise, AEP Texas applies MMM to compute the measure of rate relief, consistent with the *Reconsideration*

Decision and the rulemaking wherein it was adopted. In executing these calculations, AEP Texas also incorporates the technical corrections that it noted in *AEP Texas Opening*, some of the technical corrections described in *BNSF Opening*, and certain additional corrections that were discovered by AEP Texas in the course of its analysis of BNSF's corrections.⁵ The results of the calculations undertaken in this Reply are shown in Table 4, *infra*, and in AEP Texas' supporting electronic workpapers.

II. Cost of Capital

1. The Board Has the Legal Authority to Restate the TNR's Cost of Capital for All Years

In accordance with the Board's *Reconsideration Decision*, AEP Texas' Opening Fourth Supplemental Evidence included a recalculation of stand-alone costs for the TNR in which capital costs for each of the years 1998-2005 were developed using the CAPM cost of equity model. See *AEP Texas Opening* at 15-24 and Table 7. In opposing any restatement of TNR capital costs under the CAPM cost of equity approach for any year prior to 2006, BNSF first argues that the Board has no legal authority to do so. According to BNSF, the Board's annual industry-wide cost of capital determinations made for purposes of assessing the revenue adequacy status of the major railroads, which for 1998-2005 were

⁵ As BNSF notes, this approach to technical corrections was previously agreed to by the parties. *BNSF Opening* at 8.

calculated using the discarded single- stage DCF model, have the “force of the law,” and bind the Board in *this* proceeding under the ruling of the Supreme Court in *Arizona Grocery Co. v Atchison, Topeka & Santa Fe Ry* , 284 U.S. 370 (1932) BNSF’s argument is wholly without merit.

Arizona Grocery stands for the proposition that once the Board formally prescribes a maximum reasonable rate, it may not retroactively order a reduction in that rate and award reparations based on the difference. *Id* , 284 U.S. at 389 It long has been held both by the courts and the Board (and its predecessor) that *Arizona Grocery* has no application in circumstances where the agency has not entered a final rate prescription order. *See B P W Coast Prods , L L C v F E R C* , 374 F.3d 1263, 1304 (D.C. Cir. 2004); *Anker Meat Co v Great N Ry* , 281 I.C.C. 179, 182 (1951); *Standard Oil Co v Atchison, Topeka & Santa Fe Ry* , 280 I C C 374, 377 (1951). As the D.C. Circuit summarized in 2001:

Arizona Grocery deals only with the power of the ICC to award reparations to shippers for unreasonable rates that they had paid to carriers. . *Arizona Grocery* has been and should be understood in the terms in which it was decided, as a proscription against the retroactive revision of established rates through ex post reparations.

Verizon Tel Cos v F C C , 269 F 3d 1098, 1107 (D.C. Cir. 2001). Indisputably, no rate prescription has been entered yet in this proceeding. Indeed, a principal legal effect of the Board’s *Reconsideration Decision* is that no final order of any kind governs the rates at issue here *See United Transp Union v I C C* , 871 F 2d

1114, 1116 (D.C. Cir. 1989) Under these circumstances, *Arizona Grocery* simply does not apply.

Woven through BNSF's *Arizona Grocery* argument is the false notion that the Board's determination of the cost of capital for the TNR is a "quasi-legislative" action, which in turn is inexorably tied to the Board's prior cost of capital determinations in the context of annual revenue adequacy findings. When it comes to the cost of railroad capital, however, Congress' only mandate is found in 49 U.S.C. § 10704(a) (2) and (3), which only addresses the general industry determination for revenue adequacy purposes. Assuming, *arguendo*, that *Arizona Grocery* limits the Board's ability to make a retrospective correction to a prior cost of capital finding, it only could apply to the general industry determination for revenue adequacy purposes. Consistent with the Board's representations to the D.C. Circuit,⁶ there is no legal impediment to the restatement of capital costs – or any other component of a SAC determination – in a pending, individual rate adjudication, particularly where, as here, the Board has notified the parties of the potential change and given them a fair opportunity to address the relevant issues. *Cf. Oxy USA, Inc. v. FERC*, 64 F.3d 679, 699 (D.C. Cir. 1995).

In the original *Coal Rate Guidelines* decision, the Board's predecessor clearly held that the industry cost of capital as determined for revenue

⁶ See Joint Brief of the Surface Transportation Board and United States, *BNSF Ry. v. STB*, No. 06-1372 (D.C. Cir. Jan. 8, 2008) at 46-47 ("STB Brief").

adequacy purposes would not necessarily be the cost of capital standard for an individual stand-alone railroad.

Presumably, the cost of capital for the SAC system would be at the same level we have prescribed in Ex Parte No. 393, *supra*. However, the proponent of a SAC model may use some other level of capital costs tailored more particularly to the capital sources the SAC system would draw upon, if it fully supports its proposed figures.

1 I.C.C.2d 520, 544 n.63 Since 1981, the agency consistently has affirmed that while the annual industry cost of capital finding *may* also be used in individual rate proceedings,⁷ parties to those proceedings can propose and endeavor to justify alternative capital cost scenarios. And while it is true that an individual rate proceeding is not the place to argue for a different methodology for calculating the industry cost of capital for revenue adequacy purposes, the Board routinely *does* entertain arguments and evidence advocating the use of alternative capital costs for a particular stand-alone system. *See FMC Wyo Corp v Union Pac R R*, 4 S.T.B. 699, 846 (2000) (“*FMC*”), *Wis Power & Light Co v Union Pac R R*, 5 S.T.B. 955, 982-984 (2001); *Tex Mun Power Agency v Burlington N & Santa Fe Ry*, 6 S.T.B. 573, 751 (2003); *Carolina Power & Light Co v Norfolk S Ry*, STB Docket No. 42072 (STB served Dec. 23, 2003) at 28-29. Plainly, the Board’s annual cost of capital findings pursuant to 49 U.S.C. § 10704 (a)(2) are not “prescribed rates” within the meaning of *Arizona Grocery*

⁷ *See, e.g., Railroad Cost of Capital – 2006*, STB Ex Parte No. 558 (Sub-No. 10) (STB served Apr. 14, 2008) at 1.

In defending its decision in *Major Issues*,⁸ the Board articulated the legal principles that should be applied here. the Board “ordinarily applies new rules to all pending cases,” and where the new rule alters a prior standard, the Board will give the parties “an opportunity to introduce new evidence bearing on the new standard. . . .”⁹ The Court of Appeals agreed:

A new rule may be applied retroactively to the parties in an ongoing adjudication, so long as the parties before the agency are given notice and an opportunity to offer evidence bearing on the new standard, and the affected parties have not detrimentally relied on the established regime.

BNSF Ry v STB, 526 F.3d 770, 784 (D C. Cir. 2008) (“*Major Issues Appeal*”) (citing *Consol Edison Co v F E R.C* , 315 F.3d 316, 323 (D C Cir 2003)). The CAPM methodology is not only a new rule, but as discussed *infra*, it is demonstrably superior to its predecessor. The instant proceeding obviously is an “ongoing adjudication,” and the parties have been given the opportunity to address application of the new methodology to determine capital costs for the TNR. Moreover, BNSF cannot claim any legitimate reliance interests in the discontinued single-stage DCF approach. Since 1981, the Board and its predecessor consistently have acknowledged that the proponent of a specific stand-alone

⁸ *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1) (STB served Oct. 30, 2006) (“*Major Issues*”), *aff’d sub nom BNSF Ry v STB*, 526 F.3d 770 (D C Cir. 2008).

⁹ See *STB Brief* at 58

system may proffer and support a cost of capital for that system which is different from the industry cost used in the determination of revenue adequacy, and AEP Texas specifically raised the issue of the validity of the single-stage DCF formula in earlier phases of this case. Under the circumstances, the Board has full legal authority to restate the TNR's cost of capital using CAPM cost of equity for all relevant years.

2. Restating The Cost of Capital for All Years In This Case Is Consistent With The Board's Action In *Major Issues*

Gratuitously suggesting that AEP Texas is "confuse[d]" over the distinction between quasi-legislative and quasi-judicial agency action, BNSF asserts that the Board's application of its *Major Issues* rules changes to the record in this case does not support correction of the 1998-2005 cost of capital calculations as well.¹⁰ In point of fact, it is BNSF that seeks to confuse a rather straightforward issue.

Like *Ex Parte No. 664*, the Board's *Major Issues* proceeding was a rulemaking, wherein the Board acted to change key rules governing the determination of maximum reasonable rates on captive coal traffic. See *Major Issues* (STB served April 14, 2006) at 3-4. With the subsequent approval of the Court of Appeals, the Board then applied its new rules in this adjudicatory proceeding, justifying its action on the grounds that the parties had been given an

¹⁰ *BNSF Opening* at 17.

opportunity to address that application in supplemental evidentiary submissions. *Major Issues Appeal*, 526 F. 3d at 784, *September Decision* at 3-4. Significantly, the Board applied its new rules to the stand-alone cost, variable cost, and maximum rate determinations for *each year* at issue in this case, including those which pre-dated the *Major Issues* decision.

Consistency in the application of regulatory standards and considerations of fundamental fairness require that for purposes of maximum rate determinations in this case, the cost of capital should be treated the same as the other components that go into those determinations. Just as the Board applied the new and (in the Board's view) superior *Major Issues* rules for the allocation of cross-over revenues and calculation of variable costs in each year implicated by the maximum rate analysis, so too it should apply the superior¹¹ CAPM approach adopted in *Ex Parte No. 664* to determine the TNR cost of equity for those years. Both parties have had the opportunity to offer evidence and argument concerning the issue, and AEP Texas submits that the merits clearly favor a restatement.

BNSF's reference to the Board's admonition in *FMC* that an individual rate proceeding is not the place to challenge the methodology used to calculate the railroad industry cost of capital for revenue adequacy purposes¹² is a

¹¹ As discussed *infra*, there is no legitimate basis on the record to deny the superiority of CAPM over the discarded single-stage DCF approach, as Board counsel acknowledged to the Court of Appeals. See Transcript of Oral Argument in *WCTL v STB*, No. 07-1064 (D.C. Cir.) at 12.

¹² See *BNSF Opening* at 18.

red herring, as no such claim is being advanced here by AEP Texas. Indeed, AEP Texas supports application of the methodology adopted in *Ex Parte No. 664*, the rulemaking initiated specifically for that purpose. Moreover, BNSF is flatly wrong in its assertions that the Board “expressly states in its annual cost of capital determinations that the determinations will be used in rate reasonableness cases,” and that the calculation of the cost of capital for a SARR is not a quasi-judicial function.¹³ As noted *supra*, the Board’s annual industry cost of capital determinations state only that those findings “*may* also be used in other regulatory proceedings,”¹⁴ and the *Coal Rate Guidelines* specifically contemplate a case-by-case consideration of a SARR’s cost of capital. *Coal Rate Guidelines*, 1 I.C.C.2d at 544 n.63.

**3. CAPM Is a Superior Methodology
For All Years At Issue**

BNSF next claims that there is no reason to consider a restatement of the TNR’s cost of capital for 1998-2005 in this case because there has been no showing that the single-stage DCF approach “had produced flawed or inaccurate results in the past.” *BNSF Opening* at 20. However, the record undermines BNSF’s position.

¹³ *BNSF Opening* at 19

¹⁴ *Railroad Cost of Capital – 2006*, STB Ex Parte No. 558 (Sub-No. 10) (STB served April 14, 2008) at 1 (emphasis supplied).

There can be no serious dispute that the Board replaced the single-stage DCF approach with CAPM because the latter was shown to be a superior method for estimating the railroads' cost of equity, which produced more accurate results than its predecessor. For example, at the outset of its decision in *Ex Parte No. 664*, the Board stated that its action was motivated by the statutory directive to "ensure the availability of accurate cost information in regulatory proceedings." *Id.* (STB served January 17, 2008) at 1 (*citing* 49 U.S.C. § 10101(14)). The fact that the Board adopted CAPM consistent with this directive by definition is an acknowledgement that the single-stage DCF approach was *less* accurate

BNSF likewise is wrong in asserting that the Board found no flaws in the discarded single-stage DCF model. After noting that the model "has been displaced by more current and precise techniques," the Board observed that "the single-stage DCF model estimates a high cost of equity for which the reputable finance experts that testified in this proceeding did not provide support." *Id.* The Board then went on to identify a core methodological flaw that justified discontinuing the use of that model:

The simplicity of this model, however, is due in part to an assumption that the 5-year growth rate will remain constant forever. Yet all the experts agree that the growth rate of a particular industry cannot exceed the long-term growth rate of the economy indefinitely. Thus, in years when the 5-year growth rate is very high, this model may overstate the cost of equity. Similarly, in years when the railroads experience a

downturn and the predicted 5-year growth rate is very low, the model may understate the cost of equity

Ex Parte No 664 (STB served January 17, 2008) at 4.

In its Opening Evidence during the current phase of this proceeding, AEP Texas demonstrated that in *each year* from 1998 through 2005, the single-stage DCF model assumed unrealistically high perpetual growth rates that produced overstatements in the cost of equity. These rates ranged from a low of 10.66% to a high of 13.66%,¹⁵ far above the 6-7% rate that is recognized as a sustainable pace of growth even under the most optimistic conditions. *See* S.P. Pratt, *Cost of Capital: Estimates and Applications* 113 (2d ed. 2002). BNSF's denials notwithstanding, there is considerably more than "a scrap of evidence"¹⁶ which shows that the single-stage DCF overstated the railroads' cost of equity for each of the years at issue here.

Equally fallacious is BNSF's claim that CAPM only should be considered superior to the single-stage DCF approach for purposes of future cost of capital determinations.¹⁷ In *Ex Parte No 664*, the Board summarized the evidence of record as showing "that single-stage DCF models had fallen into disfavor in the finance and academic communities and that CAPM was a more current and widely used approach to estimating the cost of equity." *Id.* (STB

¹⁵ *AEP Texas Opening* at 26, Table 1

¹⁶ *BNSF Opening* at 21.

¹⁷ *BNSF Opening* at 22.

served Jan. 17, 2008) at 5. However, these conclusions were not the consequence of some sudden revelation that focused solely on the future CAPM has been the preferred approach to cost of equity determinations for over a decade. See R. Bruner, *et al* , *Best Practices in Estimating the Cost of Capital Survey and Synthesis*, Financial Practice and Education, Spring/Summer 1998, at 15 (“CAPM is the dominant model for estimating the cost of equity.”); Green, Lopez & Wang, *Formulating the Imputed Cost of Equity Capital for Priced Services at Federal Reserve Banks*, FRBY Econ. Policy Rev., Sept. 2003, at 56 (“CAPM is still the most widely used model in classrooms and the financial industry for calculating the cost of capital”).

In short, the records here and in *Ex Parte No 664* demonstrate the superiority of CAPM, both retrospectively and prospectively, and consistent with the Board’s responsibility under 49 U S C § 10101(14), provide ample justification for a restatement of the TNR’s cost of capital for each of the years 1998-2005.

**4. An Accurate Restatement of the TNR’s
Cost of Capital Will Not Undermine
Sound Regulatory Policy**

BNSF’s final, and in many respects most fantastic argument against a proper restatement of the TNR’s cost of capital, is that to make such an adjustment in this single case would “undermine investor expectations and create uncertainty that could discourage investment in the rail industry ” *BNSF Opening*

at 23 The claim is without support either in the record or in sound policy considerations.

First, the record assembled in *Ex Parte No 664* clearly established that the investor community has been relying on the CAPM approach to evaluate equity costs for many years. *See, e g , Ex Parte No 664* (STB served August 20, 2007) at 6. No reliable evidence supported the suggestion that the results of the Board's single-stage DCF calculations played any meaningful role with respect to investors' decisions vis-à-vis the railroad sector, and BNSF itself acknowledged that its own calculated cost of equity – a more likely investor data reference – was well below the single-stage DCF result. *See Ex Parte No 664* (STB served January 17, 2008) at 2.

Second, it is hard to take seriously the suggestion that by considering a restatement of the TNR's cost of capital solely for application in this case – as the Board represented to the Court of Appeals it would do¹⁸ – investor expectations as regards the rail sector somehow could be affected to any meaningful degree. AEP Texas has not requested, nor is the Board contemplating a broad revision of prior revenue adequacy determinations on an industry-wide basis. The only effect of the restatement that AEP Texas seeks would be some reasonable constraint on BNSF's pricing with respect to the captive Oklahoma

¹⁸ *STB Brief* at 46-47.

coal movement,¹⁹ consistent with statutory directives²⁰ and the *Coal Rate Guidelines*. In reality, BNSF is claiming that any Board action which leads to a regulation of its rates might deter investors, a position that the Board already has squarely rejected *See Ex Parte No 664* at 11.

In an effort to buttress its factually unsupported claim that a correction of the TNR's cost of capital calculations would undermine investor confidence in the railroad sector, BNSF offers the joint Verified Statement of Robert Hamada and Rajiv Gokhale ("Hamada/Gokhale"), who opine not only that investor confidence could erode, but that the restatement advanced by AEP Texas would "risk chaos in the regulatory system." *BNSF Opening*, Exhibit 1 and 2. However, these consultants' speculative conclusions cannot withstand reasoned scrutiny.²¹

Accompanying this Reply is the Verified Statement of Dr James E. Hodder, the Charles and Laura Albright Professor of Finance at the University of Wisconsin, Madison. Having reviewed the Hamada/Gokhale claims, Dr Hodder concludes that none of the three bases offered by BNSF's consultants as support

¹⁹ In 2007, the Oklahoma movement represented approximately 2,500,000 tons of coal, or only 0.86% of BNSF's total coal traffic for that year, and an even smaller percentage of its total system traffic.

²⁰ *See* 49 U.S.C. §§ 10101(14), 10701(d).

²¹ Among other deficiencies, Hamada/Gokhale failed to provide any workpapers for their analyses.

for ignoring the effect of application of the superior CAPM approach on the TNR's 1998-2005 cost of capital is sound. Specifically:

1. Hamada/Gokhale's stated concern that railroad investors might react adversely to the use of CAPM for prior years is overblown, and improperly endorses continued reliance on a demonstrably inaccurate model simply to favor one segment of the investment community. V.S. Hodder at 4-5

2 Hamada/Gokhale's argument that had the Board actually applied CAPM in the years preceding 2006 it might have used inputs different from those reflected in the 2006 determination is pure conjecture, and ignores the extensive consideration given by the Board to all aspects of the CAPM approach prior to its adoption V.S. Hodder at 5-6

3. Hamada/Gokhale's claim that allowing the use of CAPM in this case somehow would lead to a flood of litigation that would disrupt the rail regulatory system ignores both the paucity of cases that arguably could be affected, and the Board's own representations to the D.C. Circuit that a case-by-case approach to the pre-2006 use of CAPM was the proper course. V S. Hodder at 6-7.

The integrity of the regulatory process in no way would be threatened by a restatement of the TNR's 1998-2005 cost of capital using CAPM. To the contrary, and consistent with the Board's prior findings in *Ex Parte No 664*, such a restatement would serve the statutory goal of reliance on the most accurate cost information available in the adjudication of AEP Texas' individual rail rate reasonableness claim.²²

²² Hamada/Gokhale offer their own CAPM cost of equity calculations (not supported by any workpapers) covering the period 1990-2005, which they argue

**5. The Board Should Use CAPM-Derived
Costs of Equity for Future Periods**

The Board's *Reconsideration Decision* directed the parties to comment on the methodology that the Board should use to forecast the cost of capital for the TNR in future periods (2007-2020) *Id* at 8. In its Opening Evidence, AEP Texas showed that the Board should forecast the cost of capital for future periods (2007-2020) using one of two methods (i) an average of the cost of capital for all periods (1998-2006) as determined using CAPM-based costs of equity; or (ii) an average of AEP Texas' 2005 restated cost of capital (using a CAPM-derived cost of equity) and the 2006 cost of capital.²³ BNSF, on the other hand, argues that the Board should use an average of the historic cost of capital including costs determined using the discarded single-stage DCF model, to determine the cost of equity for the period 2007-2020, on the ground that the Board has used this approach in the past *BNSF Opening* at 25. BNSF's position should be rejected.

demonstrates volatility in the railroad industry betas and overall cost of capital. However, their analysis is misdirected. Their own calculations show that for 1998-2005 (the relevant time period in this case), the railroad industry betas and resulting costs of capital using CAPM-derived costs of equity were relatively stable. Moreover, the single-stage DCF costs of equity were consistently higher during this same period – just the problem that the Board identified in *Ex Parte No 664*.

²³ In compliance with the Board's directive, AEP Texas also submitted calculations that relied exclusively on the 2006 cost of capital for future years

While the Board has favored a multi-year average in forecasting a SARR's cost of capital in future years, that practice evolved before the Board recognized that the single-stage DCF procedure on which the prior findings were based was flawed and should be replaced. BNSF attempts to toe a fine line by suggesting that the Board never specifically said that its prior annual cost of capital determinations were flawed, but this ignores the record established in *Ex Parte No 664*, which firmly established that for the periods at issue in this case, the single-stage DCF methodology overstated the railroad industry cost of equity. The Board specifically compared the cost of equity using CAPM to that using the single-stage DCF for all periods at issue in this case, and determined that the single-stage DCF method produced inflated results vis-à-vis CAPM *Ex Parte No 664* at 7. As noted *supra*, the Board also found that the single-stage DCF methodology had been supplanted in the financial community because CAPM produces more accurate results. BNSF's position that the Board should use the historical cost of capital for the period 1998-2005 effectively would project a critical inaccuracy forward into the TNR's future. In addition, as AEP Texas explained in its Opening Evidence, including the single-stage DCF perpetual growth rates in the TNR future periods clearly was at odds with the rate of revenue growth predicted for the TNR. *See AEP Texas Opening* at 25-26

To ensure more accurate and fairer results here, it is far better for the Board to use one of AEP Texas' proposed approaches rather than an average that is heavily weighted with equity costs using a method that the Board has rejected

And by using an average of the cost of capital derived using CAPM costs of equity for all periods (1998-2006), the Board's preference for using an average of multiple years of data is easily satisfied.

Addressing one of the cost of capital forecast options proposed by the Board – using only the 2006 cost of equity to set the cost of equity for the TNR for the balance of the DCF model (2007-2020) – BNSF suggests that this option should be avoided because the Board currently is considering augmenting the CAPM procedures with a multi-stage DCF process *Use of a Multi-Stage Discounted Cashflow Model In Determining the Railroad Industry's Cost of Capital*, Ex Parte No. 664 (Sub-No.1) (served Aug 11, 2008) (“*Multi-Stage DCF*”). BNSF posits that since the Board is considering using two methods to calculate the industry's cost of capital for future years, it should use two methods (single-stage DCF and CAPM) to forecast the TNR's cost of equity. For the reasons discussed herein and in AEP Texas' Opening Evidence (*AEP Texas Opening* at 21-25), the proper approach for the Board to follow is to use an average of CAPM-derived capital costs for all years. However, BNSF's argument against reliance on the 2006 determination also fails

In the latest iteration of the cost of capital methodology proceeding,²⁴ the Board stated again that the single-stage DCF model it had used between 1981 and 2005 was significantly flawed, and could not be used to make

²⁴ *Id* at 3.

future cost of capital determinations. The Board now is proposing a new multi-stage DCF procedure that it believes could be useful as an alternative method to “complement” CAPM. *Multi-Stage DCF* at 1. The merits of this proposal have yet to be fully aired or considered. However, the fact that the Board is examining a multi-stage DCF approach does nothing to rehabilitate the single-stage DCF model, or support its use in combination with CAPM. Rather than enhancing the accuracy of the forecast of the TNR’s future cost of capital, any reliance on the single-stage DCF procedure would ensure inaccurate results that would prejudice AEP Texas and its ratepayers.

6. At a Minimum, the Board Should Restate the TNR’s 2005 Cost of Capital Using CAPM

In its Opening Evidence, AEP Texas recounted the procedural history of this case surrounding the proper calculation and application of the 2005 railroad industry cost of capital. *See AEP Texas Opening* at 11-15. The record established that AEP Texas timely raised the issue of the proper method for calculating the 2005 cost of capital, and argued against inclusion of a single-stage DCF derived cost of equity figure in the determination of SAC in this case. *See AEP Texas Opening* at 11 (*citing* AEP Texas’ Rebuttal Second Supplemental Evidence, July 14, 2006 at 19-20). Moreover, before the Court of Appeals, the Board defended its inclusion of that 2005 figure in the *September Decision* by emphasizing AEP Texas’ right to seek a redetermination if – as in fact occurred –

the Board changed its methodology in a manner that would have made a material difference in the outcome:

[N]othing in the Board's AEP decision deprives the shipper there of its statutory right to seek reopening of its individual rate case (as opposed to the broader 2005 cost-of-capital proceeding) if applying the new methodology would materially affect its claim. . . . In the meantime, the Board has not prejudged any future request to reopen that case, or any other individual adjudicatory proceeding.

STB Brief at 46-47 The proper course for the Board to follow here is to use CAPM to calculate the cost of equity for the TNR for each of the historic years at issue (1998-2005). Should the Board decline to do so, however, then consistent with its prior representations to AEP Texas and the Court of Appeals, at a minimum the Board should restate the 2005 cost of capital using CAPM

III. Revised Maximum Rate Calculations

In its Opening Evidence, AEP Texas complied with the Board's *Reconsideration Decision* and performed several alternative stand-alone cost calculations using cost of capital figures determined by application of the CAPM and single-stage DCF methodologies AEP Texas also included a stand-alone cost calculation based on 2005 and 2006 CAPM-derived capital costs, with an average of those years projected forward In this Reply Evidence, AEP Texas has updated its calculations to reflect the technical corrections addressed in Part IV, below. These technical corrections did not materially change the stand-alone cost

calculations that AEP Texas made in its Opening Evidence. Thus, AEP Texas largely confines its discussion below to the parties' differences in the stand-alone cost calculation procedures and their differences in restating the cost of the capital for the period 1998-2005 using CAPM procedures.

1. SAC and Cost of Capital Calculations

As noted, AEP Texas' Opening Evidence included three stand-alone cost calculations. One calculation was developed using cost of capital estimates containing CAPM costs of equity for all years. A second calculation was made using single-stage DCF costs of equity for 1998 to 2004 and an average of CAPM costs of equity for 2005 and 2006 for future periods. The third calculation of stand-alone costs, as directed by the Board, was made utilizing single-stage DCF costs of equity for 1998 to 2005 and a CAPM cost of equity for 2006 and the remainder of the DCF period.²⁵

BNSF's Fourth Supplemental Evidence included three SAC calculations using different cost of capital estimates. Like AEP Texas, BNSF submitted a SAC model using what it states are historic CAPM costs of equity in

²⁵ AEP Texas also included a fourth calculation of stand-alone costs utilizing single-stage DCF costs of equity for 1998-2005, CAPM cost of equity for 2006, and an average of those costs of equity for future periods. Under this procedure, the TNR's revenues marginally exceed stand-alone costs over the life of the DCF period. See AEP Texas Opening e-workpaper "DCF WITH 2006 CAPM AND AVERAGE OF EQUITY.xls"

all periods (including the AAR's proposed cost of equity for 2007).²⁶ BNSF also submitted a SAC model using single-stage DCF costs of equity for 1998 through 2005, CAPM cost of equity for 2006, the AAR's proposed CAPM cost of equity for 2007, and an average of all these costs of equity going forward. *See BNSF Opening* at 29-30. Finally, BNSF submitted a third SAC model, which uses historic single-stage DCF costs of equity for 1998 to 2005, the STB's CAPM cost of equity for 2006, the AAR's estimate of the 2007 CAPM cost of equity, and an average of the 2006 cost of equity and the AAR's proposed 2007 cost of equity for future periods. *Id.* at 30.

AEP Texas identified certain flaws in BNSF's calculations, which are explained below. Thus, AEP Texas' CAPM-based cost of capital estimates for 1998 to 2005 are the only fully supported estimates included in the record, as they are the only figures calculated consistent with the STB's CAPM procedures as applied in *Cost of Capital – 2006*

a. 1998-2005 CAPM Cost of Equity

AEP Texas developed CAPM cost of equity estimates for 1998 to 2005 consistent with the STB's methodologies adopted in *Ex Parte No. 664*, and

²⁶ The Board has not yet adopted an industry cost of capital for 2007, so consistent with established precedent, AEP Texas uses the 2006 figure as the most recent available

first applied in *Cost of Capital – 2006*.²⁷ AEP Texas developed 5-year, merger-adjusted railroad industry betas by regressing excess returns for a market-weighted portfolio of railroad common equity against excess returns on the S&P 500 Price Return Index over a 260 week period. AEP Texas then applied its calculated railroad betas, along with annual average yields to maturity for 20-year T-bonds and the historic long-term market risk premium as calculated by Morningstar, Inc. (“Morningstar”), to develop CAPM costs of equity for 1998 to 2005.

BNSF’s CAPM costs of equity and capital for the 1998 to 2005 period were developed by its witnesses Hamada/Gokhale, and included in Exhibit C to their verified statement.²⁸ A comparison of AEP Texas’s CAPM calculations to Hamada/Gokhale’s calculations shows that both parties agree upon the average-yield to maturity on 20-year T-Bonds and Morningstar’s historic market risk premium. However, Hamada/Gokhale’s historic beta estimates differ slightly

²⁷ See AEP Texas Opening e-workpapers “1998 to 2001 Betas (with SP and ATSF).xls,” “2002 CAPM.xls,” “2003 CAPM.xls,” “2004 CAPM.xls,” “2005 CAPM.xls,” and “Cost of Capital Summary.xls.”

²⁸ BNSF’s Fourth Supplemental e-workpapers note that the CAPM cost of equity estimates for 1998 to 2005 were developed in the AAR’s Cost of Capital evidence in STB Ex Parte No. 558 (Sub-No. 11), filed May 28, 2008. See BNSF Opening e-workpaper “BNSF 6-15-06 Supplemental Reply Exhibit III.H-1_STB CAPM.xls,” sheet “Cost of Capital,” cell D3. However, a review of the referenced AAR filing shows that the AAR did not include historic CAPM cost of equity estimates for this specific time period in its Ex Parte No. 558 (Sub-No. 11) evidence. Moreover, the CAPM cost of equity estimates included in BNSF’s DCF model match those included in Hamada/Gokhale’s Exhibit C. AEP Texas assumes the reference in BNSF’s e-workpapers is a typographical error.

from those calculated by AEP Texas, with the differences ranging from 0.01 to 0.05.²⁹

Hamada/Gokhale did not include their workpapers in BNSF's Fourth Supplemental Evidence, so AEP Texas was unable to definitively determine the reasons for the differences in beta estimates.³⁰ Thus, AEP Texas continues to rely on its 1998 to 2005 beta estimates developed in its Opening Evidence.

b. 1998-2000 Debt and Equity Weights

Prior to its decision in *Cost of Capital – 2006*, the ICC and the Board had calculated the railroad industry average market capitalization using monthly average railroad stock prices for each railroad and the number of each railroad's shares outstanding.³¹ The Board uses common equity market value, along with estimated preferred equity and debt market values, to calculate market weights used to calculate the railroad industry weighted-average cost of capital

²⁹ In 2003 and 2004, AEP Texas' beta estimates match Hamada/Gokhale's estimates when rounded to the nearest hundredth.

³⁰ The differences could be due to the parties' sources of data and the adjustments made to account for railroad mergers. Hamada/Gokhale state that they relied upon proprietary data provided by CRSP for their regression model. AEP Texas relied upon publicly available stock data from Yahoo! Finance for weekly return data for the four railroads currently used in the cost of capital determination and the Kansas City Southern Railway, and only used CRSP proprietary data for historical stock and market capitalization data for the Southern Pacific Railway and the Atchison, Topeka & Santa Fe Railway, as public data was not readily available for those railroads. Hamada/Gokhale also did not indicate how they accounted for the mergers in their beta estimates.

³¹ See, e.g., *Cost of Capital – 2005* at 17 and Appendix D of the Verified Statement of Craig F. Rockey, Vice President – Policy and Economics filed in support of the AAR's Opening Evidence in the *Cost of Capital – 2005* proceeding

Beginning with *Cost of Capital – 2006*, the Board changed the approach for estimating the average common equity market value. Instead of relying upon monthly average stock price data as had been done historically, the Board began using weekly closing stock price data and shares outstanding to calculate common equity market capitalization.³² The use of weekly closing market prices was a natural extension of the beta estimation process, and provided additional data points with which to estimate actual railroad market weights

AEP Texas' Opening Evidence adjusted the common equity market weights for the 1998 to 2000 SARR construction period to reflect the common equity market capitalization methodology adopted in *Cost of Capital – 2006*.³³ Hamada/Gokhale did not adjust market weighting in their cost of capital estimates, and instead relied upon common equity market weights developed under the Board's prior methodology.³⁴ AEP Texas continues to use its revised common equity market rates in this Reply, which are consistent with the Board's current cost of capital methodology

c. BNSF's Use of the AAR's 2007 Proposed Cost of Equity

BNSF pointlessly adds another layer of complexity to this extended process by including in its SAC models the AAR's proposed cost of equity for

³² See *Cost of Capital – 2006*, and Appendix A of the Verified Statement of Craig F. Rockey, Vice President – Policy and Economics filed in support of the AAR's Opening Evidence in the *Cost of Capital – 2006* proceeding

³³ See AEP Texas Opening c-workpaper "Cost of Capital Summary.xls."

³⁴ See Hamada/Gokhale VS at Exhibit C.

2007 Not only does BNSF's approach make comparisons of the parties' calculations more difficult, but BNSF is well aware that the AAR's proposed 2007 cost of equity is not final nor is it an agreed upon figure. Indeed, the AAR's calculations are being challenged in the *Railroad Cost of Capital – 2007* proceeding.³⁵ As the Board did not invite the parties to submit non-final 2007 cost of capital calculations in this Fourth Supplemental round of evidence, AEP Texas has not revised its calculations to reflect such preliminary data.

2. SAC Results

As noted *supra*, AEP Texas has updated its stand-alone cost calculations from each of the scenarios presented in its Opening Evidence to reflect the technical corrections discussed below. For the reasons addressed in the previous sections, AEP Texas continues to use its opening cost of capital calculations in its revised SAC calculations. As shown in Table 1 below, when the CAPM cost of equity is used for all periods, the TNR's revenues exceed its costs in all periods.³⁶

³⁵ See *Railroad Cost of Capital – 2007*, Ex Parte No. 558 (Sub-No. 11), Reply Comments of Western Coal Traffic League (filed June 23, 2008)

³⁶ See AEP Texas Reply e-workpaper "DCF With CAPM Cost of Capital.xls"

Table 1 Summary of DCF Results - 1998 - 2006 Based on CAPM and 2007 through 2020 Based on Average of Historical Data					
Year	Annual Stand-Alone Requirement	Stand-Alone Revenues	Overpayments Or Shortfalls In Revenues	PV Difference	Cumulative PV Difference
2000	\$345,270,676	\$383,310,592	\$38,039,917	\$37,720,407	\$37,720,407
2001	630,055,748	709,876,083	79,820,335	73,868,678	111,589,085
2002	628,573,493	719,910,418	91,336,925	77,901,414	189,490,499
2003	642,239,793	694,066,601	51,826,808	40,692,547	230,183,045
2004	683,384,334	731,351,008	47,966,673	33,127,176	263,310,221
2005	718,240,112	739,226,421	20,986,309	13,157,707	276,467,928
2006	748,986,727	765,914,439	16,927,712	9,545,140	286,013,068
2007	767,260,065	791,043,905	23,783,840	12,317,699	298,330,768
2008	777,538,088	799,213,358	21,675,270	10,251,751	308,582,518
2009	792,792,661	824,578,080	31,785,419	13,729,267	322,311,785
2010	802,557,624	836,795,265	34,237,641	13,505,452	335,817,236
2011	821,491,257	863,146,627	41,655,370	15,005,904	350,823,140
2012	839,489,367	907,615,581	68,126,214	22,412,551	373,235,691
2013	858,296,301	932,034,444	73,738,142	22,154,151	395,389,842
2014	876,173,366	952,214,133	76,040,767	20,863,890	416,253,733
2015	891,096,733	964,578,088	73,481,355	18,412,461	434,666,194
2016	911,261,362	990,521,874	79,260,512	18,137,501	452,803,694
2017	934,238,395	1,023,293,770	89,055,375	18,610,866	471,414,560
2018	957,349,230	1,056,342,304	98,993,074	18,892,835	490,307,395
2019	980,280,060	1,090,452,791	110,172,731	19,202,259	509,509,654
2020	1,011,819,066	1,140,775,544	128,956,478	20,526,138	530,035,792

Likewise as shown in Table 2, the TNR's revenues exceed its costs over the life of the DCF period when using the average of the 2005 and 2006 CAPM-based cost of capital for the period 2007-2020, and the single-stage DCF-based cost of capital for the period 1998-2004.³⁷

³⁷ See AEP Texas Reply e-workpaper "DCF With 2005 2006 CAPM and 2005 2006 average of equity.xls."

Table 2
Summary of DCF Results - 1998 - 2004 Based on SSDCF, 2005 & 2006 Based
on CAPM and 2007 through 2020 Based on Average of 2005 and 2006 CAPM

<u>Year</u>	<u>Annual Stand-Alone Requirement</u>	<u>Stand-Alone Revenues</u>	<u>Overpayments Or Shortfalls In Revenues</u>	<u>PV Difference</u>	<u>Cumulative PV Difference</u>
2000	\$357,494,014	\$383,310,592	\$25,816,579	\$25,572,691	\$25,572,691
2001	653,289,012	709,876,083	56,587,071	51,842,803	77,415,494
2002	652,239,054	719,910,418	67,671,364	56,177,539	133,593,033
2003	666,429,973	694,066,601	27,636,628	20,839,546	154,432,580
2004	708,704,360	731,351,008	22,646,648	14,589,650	169,022,229
2005	744,433,226	739,226,421	(5,206,805)	(3,264,491)	165,757,738
2006	776,449,671	765,914,439	(10,535,231)	(5,940,570)	159,817,168
2007	795,323,416	791,043,905	(4,279,511)	(2,216,368)	157,600,801
2008	806,067,288	799,213,358	(6,853,930)	(3,241,703)	154,359,098
2009	821,785,669	824,578,080	2,792,411	1,206,143	155,565,241
2010	832,005,834	836,795,265	4,789,431	1,889,249	157,454,490
2011	851,409,039	863,146,627	11,737,589	4,228,341	161,682,832
2012	870,050,408	907,615,581	37,565,173	12,358,405	174,041,237
2013	889,673,247	932,034,444	42,361,197	12,727,149	186,768,386
2014	908,403,782	952,214,133	43,810,351	12,020,583	198,788,969
2015	924,199,091	964,578,088	40,378,998	10,117,896	208,906,865
2016	945,252,832	990,521,874	45,269,042	10,359,096	219,265,962
2017	969,138,187	1,023,293,770	54,155,583	11,317,478	230,583,440
2018	993,186,142	1,056,342,304	63,156,162	12,053,358	242,636,798
2019	1,017,083,853	1,090,452,791	73,368,938	12,787,641	255,424,439
2020	1,049,620,495	1,140,775,544	91,155,049	14,509,245	269,933,684

AEP Texas also has included a revised SAC analysis using the 2006 cost of equity for future periods. Again, the TNR's revenues exceed its costs for the life of the DCF period. See AEP Texas Reply e-workpaper "DCF With 2006 CAPM Cost of Capital.xls." In compliance with the Board's directive, AEP Texas' revised SAC analysis utilizing an average of single-stage DCF costs of equity for 1998-2005 and the CAPM cost of equity for 2006 is shown in Reply e-

workpaper “DCF With 2006 CAPM Cost of Capital With Average Historic Equity.xls”³⁸ For the myriad reasons advanced during this latest evidentiary phase, however, the Board should not entertain such a scenario for purposes of a final resolution.

3. Application of MMM

In its Opening Evidence, AEP Texas followed the Board’s procedures in applying MMM to the SAC results in the three scenarios where the TNR’s revenues exceeded its costs, such that rate relief was available to AEP Texas in all or most periods of the 20-year rate prescription. BNSF also applied MMM in its two “alternative scenarios” where the TNR’s revenues exceeded its costs. BNSF’s MMM procedures are addressed below.

a. Base Year

BNSF used URCS costs from 2004 as the base year in its MMM calculations. AEP Texas used the same base year. Thus, there is no conflict between the parties on this point. However, where applicable, AEP Texas adjusted the URCS model to reflect CAPM-based costs of equity. *See AEP Texas Opening at 37*

b. Non-Coal Traffic

BNSF and AEP Texas both calculated MMM rates by grouping the small amount of non-coal traffic moving on the TNR between Amarillo and Fort

³⁸ The TNR’s revenues marginally exceeded its costs in this scenario.

Worth, TX with the greater quantity of coal traffic, and then applying the Board's MMM procedures AEP Texas uses the same method in this Reply Evidence.

Despite utilizing the same procedures, BNSF needlessly speculates about possible "problems" that could arise when different commodities are grouped together for MMM purposes. BNSF's comments plainly are beyond the scope of the proceeding at this point, as BNSF did not offer any alternative methodology.

c. Trackage Rights Traffic

BNSF and AEP Texas each handled the trackage rights fee that the TNR receives from the Colto Creek coal traffic by assuming that the fee paid to the TNR would become part of the revenues available to the TNR's traffic when the MMM procedures are applied. *See BNSF Opening* at 34-35 and AEP Texas Opening e-workpaper "TNR Coal Revenue Forecast 2-16-2007_ATC_STB_1_(TechCorrCajun).xls." Nevertheless, despite utilizing the same procedures, BNSF again comments on the role of trackage rights fees in future cases. As BNSF's comments likewise are beyond the scope of the proceedings at this point, AEP Texas will not respond to them.

d. Length of Haul Adjustment

BNSF's MMM calculations differed, in part, from those submitted by AEP Texas due to BNSF's application of a so-called "length of haul" adjustment, which it first proposed a month earlier in the *Western Fuels* case. *See BNSF Opening* at 35-47; Western Fuels Third Supplemental Rebuttal Narrative

(Public Version filed Aug. 15, 2008) at Part III-H-3-b. AEP Texas has serious misgivings about the legitimacy of BNSF's proposed modifications to the Board's newly adopted ATC and MMM procedures. As an accommodation to permit the Board's review of the parties' differing approaches, however, AEP Texas' electronic workpapers include comparisons of its alternative MMM results with and without BNSF's length of haul adjustment.

e. MMM Results

With the appropriate application of CAPM costs of equity and the technical corrections described below, the TNR's revenues exceed its stand-alone costs. In accordance with the Board's *Reconsideration Decision*, AEP Texas again has calculated the applicable maximum SAC rates using MMM as adopted in *Major Issues*. AEP Texas presents the most pertinent result, wherein CAPM is applied for all periods (including an average of the historical period applied to the period 2007-2020), in Table 3 below:

Table 3
MMM Rate For TNR Traffic
Using CAPM for All Periods

	Time Period (1)	MMM Rate (2)
1	2Q 2000	\$12 81
2	3Q 2000	\$12 63
3	4Q 2000	\$12 84
4	1Q 2001	\$12 45
5	2Q 2001	\$12 41
6	3Q 2001	\$12 53
7	4Q 2001	\$12 52
8	1Q 2002	\$11 84
9	2Q 2002	11 59
10	3Q 2002	11 53
11	4Q 2002	12 12
12	1Q 2003	\$12 57
13	2Q 2003	14 03
14	3Q 2003	14 11
15	4Q 2003	14 11
16	2004	\$14 82
17	2005	19 22
18	2006	19 98
19	2007	19 76
20	2008	20 14
21	2009	19 47
22	2010	19 54
23	2011	18 99
24	2012	16 80
25	2013	16 94
26	2014	17 30
27	2015	17 98
28	2016	18 12
29	2017	18 04
30	2018	17 99
31	2019	17 90
32	2020	17 36

See “AEP Texas MMM Model - All CAPM.xls.” The MMM calculations for the other scenarios where the TNR’s revenues exceed its costs are detailed in electronic workpapers “AEP Texas MMM Model - 2005 and 2006 CAPM.xls” and “AEP Texas MMM Model - 2006 CAPM.xls.”

IV. Technical Corrections

In its Opening Evidence, AEP Texas presented two technical corrections stemming from a review of the revenue and DCF-related spreadsheets included in the Board’s electronic workpapers from the *September Decision*. The first corrected an error in the rate forecast model used for the Big Cajun coal shipments. See *AEP Texas Opening* at 37. The second correction eliminated equity flotation costs that were included in the Board’s calculations despite its rejection of AEP Texas’ plan to refinance the TNR’s debt *Id* at 38-39. AEP Texas continues to make those corrections in this Reply Evidence.

BNSF proposed its own series of technical corrections that are described in detail in its e-workpaper “Technical Corrections.xls.” These technical corrections included an additional modification to general freight revenues and other modifications that extended to other areas of the SAC analysis, such as road property investment costs and operating expenses. AEP Texas reviewed BNSF’s proposed corrections, and has determined that the road property adjustments are partially correct. In addition, in the course of its review of BNSF’s corrections, AEP Texas determined that BNSF overlooked several other

road property investment and operating expense corrections that do not necessarily favor BNSF. These corrections collectively are described below.

1. Road Property Investment

BNSF made three technical corrections to the road property investment calculations made by the Board in its *September Decision*. See BNSF Opening e-workpaper “Technical Corrections xls ” As explained below, AEP Texas accepts one of BNSF’s corrections, but disputes two others

AEP Texas agrees with BNSF’s adjustment of the unit cost applicable to the TNR’s ties (*see* BNSF Opening e-workpaper “Technical Corrections xls”), and it has made the necessary modifications to the TNR’s costs. See AEP Texas Reply e-workpaper “STB Restated TOTAL Construction_1W_5_5_07.xls.”

BNSF’s second adjustment attempted to account for the cost of transition ties under turnout locations, which the Board omitted from its final road property investment calculations even though it accepted BNSF’s position that such ties were required. While BNSF correctly calculated the quantities and costs for the additional transition ties, it failed to offset those costs through a reduction in the quantity of Grade 5 cross ties being replaced by the transition ties. AEP Texas has made the necessary corrections. See AEP Texas Reply e-workpaper “STB Restated TOTAL Construction_1W_5_5_07.xls.”

BNSF's third adjustment improperly included additional highway crossing costs. BNSF assumed that the Board's *September Decision* accepted BNSF's crossing costs. *Id* at 103. However, BNSF's costs were rejected in circumstances where "there is no evidence that BNSF or its predecessors incurred costs associated with highway overpasses." *Id* Thus, the Board's e-workpaper "Overhead Grade Crossings.xls" shows that it eliminated the costs for six highway overpasses where BNSF did not show that it (or a predecessor) incurred any costs for those crossings. Consequently, the cost used by the Board in its *September Decision* should not be adjusted.

Turning to AEP Texas' additional technical corrections, the Board accepted AEP Texas' use of a 24-foot roadbed width for the TNR. *See September Decision* at 80. However, the Board's roadbed preparation costs included BNSF's cost for a proposed 28-foot wide roadbed. *See* STB e-workpaper "STB Restated Grading.xls," sheet "IIIF_17 CY Grad." AEP Texas has made the necessary corrections to its SAC calculations. *See* AEP Texas Reply e-workpaper "STB Restated Grading with 24ft roadbed.xls," sheet "IIIF_17 CY Grad."

The Board accepted AEP Texas' calculation of the distance that the TNR's rail would need to be shipped in order to reach the applicable construction railheads. *September Decision* at 89. However, the Board applied BNSF's length of haul, resulting in an overstatement in the cost to ship the rail. *See* STB e-workpaper "STB Restated TOTAL Construction_IW_5_4_07.xls," sheet "TOTALS." AEP Texas has made the necessary corrections to its SAC

calculations. *See* AEP Texas Reply e-workpaper “STB Restated TOTAL Construction_All Corrections.xls,” sheet “TOTALS.”

The Board accepted AEP Texas’ costs for the signals-related portion of the TNR’s crossing protection. *September Decision* at 103. However, the Board applied BNSF’s costs. *See* STB e-workpaper “STB Restated TOTAL Construction_IW_5_4_07.xls,” sheet “TOTALS.” AEP Texas has made the necessary corrections to its SAC calculations. *See* AEP Texas Reply e-workpaper “STB Restated TOTAL Construction_All Corrections.xls,” sheet “TOTALS ”

2. Operating Expenses

The Board accepted AEP Texas’ fringe benefits ratio applicable to training and start-up costs, *i.e.*, 33.9% *September Decision* at 60-61. However, the Board applied BNSF’s fringe benefit ratio of 43.2% *See* STB e-workpaper “TNR Training and Recruitment BNSF_STB.xls,” sheets “Recruitment,” and “Training Costs” and STB e-workpaper “OPR_EXP_STB.xls”, sheet “Summary.” AEP Texas has made the necessary corrections to its SAC calculations. *See* AEP Texas Reply e-workpapers “TNR Training and Recruitment BNSF_STB with fringe correction.xls,” sheets “Recruitment,” and “Training Costs,” and AEP Texas Reply e-workpaper “OPR_EXP_STB with corrections.xls”, sheet “Summary.”

The Board accepted AEP Texas’ annual salary for clerks included in the TNR’s general and administrative expenses. *September Decision* at 60. However, the Board applied BNSF’s salary for these positions *See* STB e-

workpaper "OPR_EXP_STB.xls," sheet "Summary." AEP Texas has made the necessary correction to its SAC calculations. See AEP Texas Reply e-workpaper "OPR_EXP_STB with corrections.xls," sheet "Summary."

The Board's calculation of the TNR's annual loss and damage costs incorrectly applied certain coal tons to the wrong commodity classification, STCC 14 rather than STCC 11 resulting in an overstatement in those costs. See STB e-workpaper "OPR_EXP_STB.xls," sheet "Summary." AEP Texas has made the necessary correction to its SAC calculations. See AEP Texas Reply e-workpaper "OPR_EXP_STB with corrections.xls," sheet "Summary."

V. Maximum Rate Results

Table 4 summarizes the maximum reasonable rates for coal service to Oklahoma based upon the evidence summarized herein, including the application of CAPM to all relevant years and to the establishment of the applicable jurisdictional threshold. In accordance with the Board's directive, maximum rate results under the other scenarios where TNR revenues exceed costs are shown in AEP Texas' reply e-workpapers "AEP Texas FS Reply MMM" and "JT Rate Summary.xls."

Table 4
Summary of Maximum Rate Calculations for Issue Traffic

	<u>Time Period</u> (1)	<u>Paid Rate</u> (2)	<u>Phase III Variable Cost 1/</u> (3)	<u>Jurisdictional Threshold 2/</u> (4)	<u>MMM Rate 3/</u> (5)	<u>Maximum Rate 4/</u> (6)
1	2Q 2000	\$15 33	\$8 04	\$14 47	\$12 81	\$14 47
2	3Q 2000	\$15 33	\$8 41	\$15 14	\$12 63	\$15 14
3	4Q 2000	\$15 33	\$8 69	\$15 63	\$12 84	\$15 33 5/
4	1Q 2001	\$15 59	\$8 75	\$15 75	\$12 45	\$15 59 5/
5	2Q 2001	\$15 59	\$8 86	\$15 95	\$12 41	\$15 59 5/
6	3Q 2001	\$15 59	\$8 84	\$15 92	\$12 53	\$15 59 5/
7	4Q 2001	\$15 59	\$8 68	\$15 62	\$12 52	\$15 59 5/
8	1Q 2002	\$15 36	\$8 34	\$15 01	\$11 84	\$15 01
9	2Q 2002	\$15 36	\$8 63	\$15 54	\$11 59	\$15 36 5/
10	3Q 2002	\$15 36	\$8 62	\$15 52	\$11 53	\$15 36 5/
11	4Q 2002	\$15 36	\$9 05	\$16 29	\$12 12	\$15 36 5/
12	1Q 2003	\$16 78	\$9 04	\$16 28	\$12 57	\$16 28
13	2Q 2003	\$16 78	\$8 85	\$15 92	\$14 03	\$15 92
14	3Q 2003	\$16 78	\$8 79	\$15 82	\$14 11	\$15 82
15	4Q 2003	\$16 78	\$8 90	\$16 03	\$14 11	\$16 03
16	2004	\$18 83	\$9 32	\$16 77	\$14 82	\$16 77
17	2005	\$19 68	\$8 94	\$16 09	\$19 22	\$19 22
18	2006	\$20 10	\$10 79	\$19 42	\$19 98	\$19 98
19	2007	\$20 26	\$10 82	\$19 48	\$19 76	\$19 76
20	2008	\$20 42	\$10 94	\$19 69	\$20 14	\$20 14
21	2009	\$21 11	\$11 10	\$19 99	\$19 47	\$19 99
22	2010	\$21 62	\$11 26	\$20 27	\$19 54	\$20 27
23	2011	\$21 90	\$11 42	\$20 55	\$18 99	\$20 55
24	2012	\$22 29	\$11 50	\$20 69	\$16 80	\$20 69
25	2013	\$22 82	\$11 70	\$21 06	\$16 94	\$21 06
26	2014	\$23 36	\$11 91	\$21 43	\$17 30	\$21 43
27	2015	\$23 90	\$12 11	\$21 79	\$17 98	\$21 79
28	2016	\$24 49	\$12 31	\$22 16	\$18 12	\$22 16
29	2017	\$25 07	\$12 52	\$22 53	\$18 04	\$22 53
30	2018	\$25 73	\$12 72	\$22 90	\$17 99	\$22 90
31	2019	\$26 43	\$12 92	\$23 26	\$17 90	\$23 26
32	2020	\$27 13	\$13 12	\$23 61	\$17 36	\$23 61

1/ Based on BNSF URCS Phase III Unit Costs including CAPM Cost of Capital
for each year 2000 through 2006 and applied to the nine inputs for each time period

2/ Column (3) x 1 80

3/ Table 3

4/ Greater of Column (4) or (5)

5/ Column (2)

VI. Conclusion

As in its Opening Fourth Supplemental Evidence, AEP Texas has demonstrated that the CAPM methodology is superior to the single-stage DCF methodology, and that the Board should use it in determining the cost of equity for the TNR for all relevant periods. Moreover, AEP Texas has demonstrated that BNSF's protestations with respect to the use of CAPM in this proceeding are without merit. Based on a proper application of the Board's current cost of capital standards, the rates at issue are shown to be unreasonably high under the *Coal Rate Guidelines*. As such, the Board should grant prescriptive relief and reparations as indicated by AEP Texas' MMM calculations

Respectfully submitted,

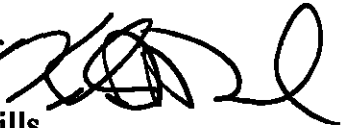
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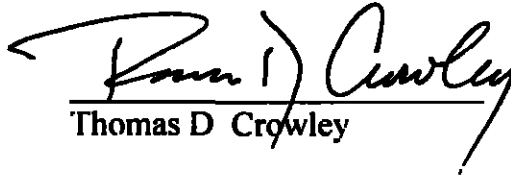


Dated: September 5, 2008

Attorneys & Practitioners

VERIFICATION

I, Thomas D. Crowley, verify under penalty of perjury that I am the same Thomas D Crowley whose Statement of Qualifications appears in Part V of the Narrative portion of the Opening Evidence of Complainant AEP Texas North Company ("AEP Texas") filed in this proceeding on March 1, 2004, that I am responsible along with Daniel L. Fapp for the portions of the foregoing Reply Fourth Supplemental Evidence of AEP Texas set forth in Sections III, IV and V: that I know the contents thereof; and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement


Thomas D Crowley

Executed on September 4, 2008

VERIFICATION

I, Daniel L. Fapp, verify under penalty of perjury that I am the same Daniel L. Fapp whose Statement of Qualifications appears in the Opening Fourth Supplemental Evidence of Complainant AEP Texas North Company ("AEP Texas"); that I am responsible along with Thomas D. Crowley for the portions of the foregoing Reply Fourth Supplemental Evidence of AEP Texas set forth in Sections III, IV and V, that I know the contents thereof; and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.


Daniel L. Fapp

Executed on September 4, 2008

VERIFIED STATEMENT

OF

JAMES E. HODDER

My name is James E. Hodder. I am the Charles and Laura Albright Professor of Finance at the University of Wisconsin-Madison. I have served on the faculty of the Wisconsin School of Business since 1992. From 1978 to 1992, I served on the faculty of Stanford University, where I received my Ph.D. in Economics in 1979. At Wisconsin, I have taught a masters-level Corporate Finance course as well as corporate-oriented courses on Financial Policy and on Multinational Business Finance. In addition, I have taught several courses on options and other derivative securities, at both introductory and advanced levels. At Stanford, most of my teaching was in corporate finance with a particular focus on valuing manufacturing and technology investments. Hence, I have been teaching corporate finance courses over a period of 30 years.

A substantial portion of my research and publications has addressed the subjects of investment evaluation and discounting. A key aspect of those subjects is the firm or project cost of capital, including appropriate risk and inflation adjustments. Another substantial portion of my research has addressed corporate capital structure. I previously have submitted testimony to the Surface Transportation Board (Board) in three coal rate cases: on behalf of Wisconsin Power & Light in its case against Union Pacific Railroad Company, on behalf of PPL Montana in its case against the Burlington Northern and Santa Fe Railway Company, and recently on behalf of the Western Fuels Association and the Basin Electric Power Cooperative in their case against the Burlington Northern and Santa Fe Railway Company. I also provided testimony to the Board on several occasions on behalf of the Western Coal Traffic League (WCTL) in connection with Ex

Parte No 664, Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, and Ex Parte No 664 (Sub-No 1), Use of a Multi-Stage Discounted Cash Flow Methodology In Determining the Railroad Industry's Cost of Capital My participation included a Verified Statement in December 2006, a Public Hearing in February 2007, a Verified Statement in September 2007, a Reply Verified Statement in October 2007, a Public Hearing in December 2007, and a Verified Statement in April 2008 A copy of my detailed curriculum vitae is included herewith as Appendix A

In the current proceeding, I have been asked by Counsel for AEP Texas North Company ("AEP Texas") to review and respond to the joint Verified Statement (VS) of Professor Robert S Hamada and Mr Rajiv B Gokhale that was submitted to the Board on behalf of BNSF Railway Company on August 8, 2008 in STB Docket No 41191 (Sub-No 1), AEP Texas North Company v BNSF Railway Co

As a threshold matter, I view the comments contained in the Hamada and Gokhale VS as largely tangential to the fundamental issue presented here, *i e*, whether the Board should utilize its approved CAPM-based procedure for estimating a railroad's cost of equity to restate the cost of capital for the years 1998-2005 for purposes of the current proceeding In my opinion, the real issue is whether the Board should use the best available methodology for determining a key component of a maximum rate analysis that spans several years, including years that pre-date the formal adoption of that methodology As a general proposition, an analyst should always seek to use the best currently available technology That is true even if the technology is being used to understand material or activities that relate to a time before that technology had been developed and/or approved for that particular use An appropriate analogy would be the current reliance on

DNA analysis to re-evaluate evidence in criminal cases that was gathered before the technique had been developed

In my view, the Board definitely should use its approved CAPM-based methodology in the current proceeding to estimate the 1998-2005 capital costs for the stand-alone railroad developed to examine the reasonableness of the rates charged by BNSF for its service to AEP Texas. During the years 1998-2005, the Board used a Single-Stage Discounted Cash Flow (DCF) procedure to estimate the railroad industry cost of equity in its annual revenue adequacy findings. That procedure rested on five-year growth projections that were (implicitly) assumed to continue in perpetuity. For the 1998-2005 period, those projections ranged from 10.66% to 13.66%.¹ During that same period actual GDP growth for the U.S. economy ranged between 3.2% and 6.6% according to the U.S. Bureau of Economic Analysis (BEA).² In my Verified Statement submitted in the Board's 2005 general Railroad Cost of Capital proceeding, I testified that a reasonable estimate of a long-run growth rate for the U.S. economy would have been 6% or less in 2005.³ The same statement would be true for the years 1998-2004.

The Board recognized in its decision for Ex Parte No. 664, Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, served January 17, 2008, that using a Single-Stage DCF procedure with railroad growth rates that substantially exceed the long-run growth rate for the economy generates cost of equity estimates which are implausibly high, and thus leads to an overstatement of the railroads' cost of capital. Indeed, this was the key flaw in the Single-Stage DCF procedure that led the Board to replace it with the CAPM approach. Given the large gaps between the 5-year growth projections and reasonable long-run growth

¹ See the Board's Railroad Cost of Capital decisions for 1998-2005.

² See data from the BEA website at <http://www.bea.gov/national/index.htm#gdp>

³ Hodder VS, December, 2006, at page 9.

rates for the U S economy. it seems clear that the Single-Stage DCF procedure was yielding estimates during the 1998-2005 period that were consistently too high by substantial amounts. The Hamada and Gokhale VS seems to confuse the issue of whether to use the best available technology with whether it would be appropriate for the Board to restate its historic cost of capital findings on an industry-wide basis for purposes of the revenue adequacy determination. The industry-wide revenue adequacy determination is not what is at issue here. Moreover, it should be clear that failure to apply the CAPM approach to the cost of equity calculations for all years relevant to this still-pending proceeding would be to ignore the best available methodology in favor of a demonstrably flawed approach.

Hamada and Gokhale propose three reasons for not using the CAPM-based methodology. Their first essentially boils down to an assertion that railroad shareholders and potential shareholders may react adversely to a Board decision to use a superior methodology for determining the stand-alone railroad's cost of equity in the current proceeding. If that methodology produces lower capital costs and (presumably) leads to a reduction in BNSF's rates. It seems unlikely to me that such a Board decision would result in a substantial adverse reaction from railroad shareholders of the type hypothesized by Hamada and Gokhale (e.g., decreased investment in the railroad industry). To the extent that the investment community considers the Board's cost of capital findings in the decision-making process, it is but one of a number of factors to be analyzed, and likely a minor one at that. In any case, Hamada and Gokhale's recommendation to continue using the clearly inaccurate Single-Stage DCF methodology would sacrifice accuracy, fairness, and economic efficiency in order to (hypothetically) make some group of investors better off. Moreover, since investors generally

hold diversified share portfolios, regulatory actions which enhance the returns earned by railroads at the expense of utility companies will tend to have offsetting effects within the overall portfolios. To the extent that utility companies pass such higher transportation costs through to their customers, those customers will have fewer resources to spend on other goods and services or to invest. This underlines the larger issue of economic efficiency and overall benefit for the economy as a whole, and emphasizes the importance of relying on the best available methodologies to avoid distortions. If we are going to calculate railroad costs, we should attempt to do so accurately, and we should certainly avoid using methodologies that are known to produce errant results.

Their second argument suggests that the Board might have implemented the CAPM-based approach in a different way, utilizing different inputs, if the Board had adopted the model before January 2008. One can certainly conjecture such a possibility, however, the record leading up to the adoption of CAPM indicates otherwise. The Board conducted rather thorough proceedings over the course of roughly two years prior to its January 2008 adoption decision. Those proceedings included both an advance notice and notice of proposed rulemaking, the receipt and consideration of extensive comments from interested parties, and two public hearings. I do not see any clear basis for concluding that the Board would have selected a different approach if it had followed such a procedure and decided the matter in, for example, 2002 as opposed to 2008. That is particularly true given that CAPM has been taught in management programs and widely utilized by corporations to internally estimate their equity costs for decades. Moreover, the most significant potential change mentioned by Hamada and Gokhale (calculation of the equity risk premium using a different procedure relying on a recent

time period or using a prospective approach) likely would result in a substantially lower cost of equity ⁴ In my opinion, their argument is far too speculative and thinly-supported to influence the Board's resolution of the issues presented

The final claim that Hamada and Gokhale put forward is that allowing the use of a CAPM-based cost of equity estimation in this case for 1998-2005 would introduce an asymmetry into the regulatory process because it "would favor a select category of litigants" ⁵ I am not aware that the Board has precluded other parties from arguing for the use of CAPM-based estimates for years prior to 2006 on a case-by-case basis, so this alleged asymmetry certainly is not obvious Indeed, the Board's brief in *Western Coal Traffic League v Surface Transportation Board* (D C Circuit No 07-1064) argued that it could and would consider CAPM-based cost of equity estimates and revisions on a case-by-case basis, exactly along the lines advanced by AEP Texas in the current proceedings The Board argued that this approach was preferable (at least from its perspective) to reopening the general Railroad Cost of Capital proceedings for years prior to 2006 Scemingly, Hamada and Gokhale want to preclude the same sort of case-by-case flexibility that the Board advocated before the Court of Appeals Hamada and Gokhale then go on to suggest that allowing "all concerned parties" to request use of a CAPM-based estimation procedure for years prior to 2006 would "Risk Chaos in the Regulatory System" (see their heading IV on page 11) That suggestion is rather extreme and appears to be a gross exaggeration Given the costs and uncertainties of litigation, and my understanding that most rail rate cases considered under the methodology being used in this case utilize a construction period

⁴ The risk-free rate input (where there was ultimately broad agreement) and the beta estimate would tend to have much smaller impacts on the cost of equity estimate

⁵ Hamada and Gokhale VS, paragraph 31

of no more than three years, a flood of rate cases advocating equity costs based on the CAPM for years prior to 2006 seems unlikely

In summary, the CAPM-based estimation proposed by AEP Texas for costs of equity in the years 1998-2005 is appropriate for generating results using the best currently available methodology. Moreover, it is perfectly consistent with the Board's case-by-case approach to considering the use of that methodology for years prior to 2006, as well as with the Board's stated goals of accurate cost determinations and enhanced economic efficiency.


Executed on September 2, 2008


James E Hodder

VERIFICATION

I, JAMES E HODDER, declare under penalty of perjury that the foregoing Statement is true and correct. Further, I certify that I am qualified and authorized to file this statement

Executed on September 2, 2008


James E. Hodder

Appendix A

JAMES E. HODDER

Charles and Laura Albright Professor of Finance

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Areas of Specialization Corporate Finance, Derivative Securities, International Finance, and Risk Management

Education

1967	B S	Industrial Engineering, Stanford University
1968	M B A	Business Administration, University of Michigan
1976	M A	Economics, University of California (Berkeley)
1979	Ph D	Economics, Stanford University

Dissertation The Hedging of Exposure to Exchange-Rate Movements

Employment

1968-69	Sylvania Electronic Systems	Project Administrative Engineer
1969-73	U S Navy	Engineering Duty Officer
1974-76	Department of Economics, University of California (Berkeley)	Research and Teaching Assistant
1976-78	Department of Economics, Stanford University	Teaching Assistant and Instructor
1978-92	Department of Industrial Engineering and Engineering Management, Stanford University:	Assistant Professor and Associate Professor, Associate Chairman 1987-1988, Ph D Program Director 1987-1992
1992-	School of Business, University of Wisconsin - Madison	Professor of Finance, Director of Quantitative Masters in Finance (QMF) Program 1995-2004, Department Chairman 2004-2008

Visiting Appointments

1986	Visiting Scholar, Department of Economics, Osaka University -- funded by a fellowship from the Japan Society for the Promotion of Science
1990-91	Visiting Associate Professor, School of Business, University of Wisconsin - Madison

Teaching

Advanced Derivatives
 Corporate Finance
 Fixed Income and Derivative Securities
 Options and Financial Futures
 Ph D Seminar Interest Rate and Credit Risk Models
 Ph D. Seminar Risk Management in Financial Institutions
 Multinational Business Finance
 Financial Policy
 Doctoral Seminar in Financial Decisions
 Engineering Economy
 International Economics

Awards

Outstanding Teacher, Department of Industrial Engineering and Engineering Management, Stanford University, 1981-82 and 1986-87

Lawrence J Larson Award for Excellence in Teaching, School of Business, University of Wisconsin-Madison, 1999

Wisconsin Idea Fellow, In recognition of extraordinary public service on behalf of the University of Wisconsin, 2004-2005

Publications.

- 1 "Foreign Investment from the Firm's Perspective," in D Bonham-Yeaman, ed , Developing Global Corporate Strategies, Academy of International Business and European International Business Association Joint Conference, Barcelona, Spain, December, 1981
- 2 "Exposure to Exchange Rate Movements," Journal of International Economics, November, 1982
- 3 "Plant Location Modeling for the Multinational Firm," with J V Jucker, Proceedings of the Academy of International Business Conference on the Asia-Pacific Dimension of International Business, Honolulu, Hawaii, December, 1982
- 4 "Financial Market Approaches to Facility Location Under Uncertainty," Operations Research, November-December, 1984
- 5 "Pitfalls in Evaluating Risky Projects," with H E Riggs, Harvard Business Review, January-February, 1985. This article has also been reprinted in Managing Projects and Programs, Harvard Business School Press, 1989 and as Chapter 3 in Kim B Clark and Steven C Wheelwright, eds , The Product Development Challenge, Harvard Business School Press, 1995
- 6 "Pricing to Reduce Investment When Costs Follow an Experience Curve. Constrained Dynamic Programming as well as Heuristic Rules," with Y A Ilan, Proceedings of the American Institute for Decision Sciences Fourteenth Annual Meeting, Western Regional Conference, Monterey, California, March, 1985
- 7 "International Plant Location Under Price and Exchange Rate Uncertainty," with J V Jucker, Engineering Costs and Production Economics, April, 1985.

- 8 "Some Aspects of Japanese Corporate Finance," with A E Tschoeigl, Journal of Financial and Quantitative Analysis, June, 1985 This article is also reprinted as Chapter 3 in Edwin J Elton and Martin J Gruber, eds , Japanese Capital Markets, Harper-Row, 1990
- 9 "A Simple Plant Location Model for Quantity-Setting Firms Subject to Price Uncertainty," with J V Jucker, European Journal of Operational Research, July, 1985
- 10 "Evaluation of Manufacturing Investments A Comparison of U S and Japanese Practices," Financial Management, Spring, 1986 This article has also been reprinted in Stephen H Archer and Halbert S Kerr, eds , Readings and Cases in Corporate Finance, McGraw-Hill, 1988.
- 11 "Capital Cost: Difference Between U.S and Japan Shrinks" (in Japanese), Nihon Keizai Shimbun, August 30, 1986
- 12 "A Multifactor Model for International Facility Location and Financing Under Uncertainty," with M C Dincer, Computers and Operations Research, 1986
- 13 "Declining Prices and Optimality When Costs Follow an Experience Curve," with Y A Ilan, Managerial and Decision Economics, December, 1986
- 14 "Technology Transfer and Second Sourcing when Production Costs Follow an Experience Curve," with Y A Ilan, IEEE Transactions on Engineering Management, February, 1987
- 15 "Simple Solution Procedures for Nonlinear Programming Problems that are Derivative Decomposable," with R C Carlson and J V Jucker, European Journal of Operational Research, July, 1987
- 16 "Corporate capital structure in the United States and Japan financial intermediation and implications of financial deregulation," in John B Shoven, ed , Government Policy Towards Industry in the USA and Japan, Cambridge University Press, 1988
- 17 "On Dumping at Less than Marginal Cost," in Developments in Pacific-Asian Business Education and Research, Volume 2, Pacific Asian Management Institute, 1989
- 18 "A Commentary on 'Japanese Capital Exports through Portfolio Investment in Foreign Securities.'" in Charles A E Goodhart and George Sutija, eds., Japanese Financial Growth, Macmillan (London), 1990
- 19 "Agency Problems and International Capital Structure," with L W Senbet, in S Ghon Rhee and Rosita P Chang, eds , Pacific Basin Capital Markets Research, Elsevier, 1990
- 20 "Valuing Flexibility as a Complex Option," with A J Triantis, Journal of Finance, June, 1990
- 21 "International Capital Structure Equilibrium," with L W Senbet, Journal of Finance, December, 1990
- 22 "Is the Cost of Capital Lower in Japan?", Journal of the Japanese and International Economies, March, 1991
- 23 "The Cost of Capital for Industrial Firms in the U S and Japan," in William T Ziemba, Warren Bailey, and Yasushi Hamao, eds , Japanese Financial Market Research, Elsevier, 1991

- 24 "Corporate Finance in Japan," with A E Tschoegl, in Shinji Takagi, ed , Handbook of Japanese Capital Markets, Basil Blackwell, 1993.
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- 27 "Risk Management and Assessment," in Richard C Dorf, ed , Handbook of Technology Management, CRC Press, 1998
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30. "Numerical Schemes for Variational Inequalities Arising in International Asset Pricing," with A. Tourin and T Zariphopoulou, Computational Economics, February, 2001
- 31 "Valuing Real Options Can Risk Adjusted Discounting Be Made To Work?", with A S Mello and G S Sick, Journal of Applied Corporate Finance, Summer, 2001
32. "Corporate Finance," in Allan Bird, ed , Encyclopedia of Japanese Business and Management, Routledge, 2002
33. "Debt/Equity Ratios," in Allan Bird, ed . Encyclopedia of Japanese Business and Management, Routledge, 2002
- 34 "Incentive Contracts and Hedge Fund Management," with J C Jackwerth. Journal of Financial and Quantitative Analysis, December, 2007 (Lead Article)

Published Book Reviews

"Review of The Economic Analysis of Industrial Projects by Lynn E Bussey," James E Hodder and James V Jucker in The Engineering Economist, Winter, 1980

"Review of Investment Analysis and Management by Anthony J Curley and Robert M Bear," in The Engineering Economist, Spring, 1980

Research in Progress.

"Default Risk with Managerial Control," with T Zariphopoulou

"Managerial Responses to Incentives Control of Firm Risk, Derivative Pricing Implications, and Outside Wealth Management," with J C Jackwerth.

"Optimal Compensation Structure for Hedge Fund Managers," with J C Jackwerth.

"Hedge Fund Performance Attribution, Time Variation, and Persistence," with J C Jackwerth and O Kolokolova

"Credit Default Risk with Optimal Management Control," with J C Jackwerth

"Recovering Delisting Returns of Hedge Funds," with J C Jackwerth and O Kolokolova

Presentations at Conferences and Public Lectures

"A Plant-Location Model for the Multi-National Firm," with J V Jucker, TIMS/ORSA Joint National Meeting, Washington, D C , May, 1980

"Exposure to Exchange Rate Movements," Annual Meeting of Western Finance Association, San Diego, California, June, 1980

"International Plant Location Under Price and Exchange Rate Uncertainty," with J V Jucker, CORS/TIMS/ORSA Joint National Meeting, Toronto, Canada, May, 1981

"Hedging International Exposure A Model with Flexible Exchange Rates and Expropriation Risk," Academy of International Business Annual Meeting, Montreal, Canada, October, 1981

"Foreign Investment from the Firm's Perspective," Academy of International Business and European International Business Association Joint Meeting, Barcelona, Spain, December, 1981

"A Simple Approach to Solving a Family of Nonlinear Programming Problems," with R C Carlson and J V Jucker, TIMS/ORSA Joint National Meeting, Detroit, Michigan, April, 1982.

"Evaluating Risky R&D Projects," with H E Riggs, TIMS/ORSA Joint National Meeting, San Diego, California, October, 1982

"A Multifactor Model for International Facility Location Under Uncertainty," with M C Dincer, Academy of International Business Annual Meeting, Washington, D C , October, 1982

"Hedging International Exposure Capital Structure Under Flexible Exchange Rates and Expropriation Risk," American Finance Association Annual Meeting, New York, December, 1982

"Technology Transfer When Production Costs Follow an Experience Curve," with Y A Ilan, TIMS/ORSA Joint National Meeting, San Francisco, California, May, 1984

"Investment and Financial Decision Making in Japanese Firms A Comparison with U S Practices," Academy of International Business Annual Meeting, Cleveland, Ohio, October, 1984

"Pricing to Reduce Investment When Costs Follow an Experience Curve Constrained Dynamic Programming as well as Heuristic Rules," with Y. A. Ilan, Fourteenth Annual Meeting of the American Institute for Decision Sciences, Western Regional Conference, Monterey, California, March, 1985

"Corporate Capital Structure in the U S and Japan Financial Intermediation and Implications of Financial Deregulation," Conference on Government Policy Towards Industry in the United States and Japan, Koret Conference Series, Center for Economic

Policy Research, Stanford, California, May, 1985. This paper was also presented at the Academy of International Business Annual Meeting, New York, October, 1985

"International Capital Structure Equilibrium," with I. W. Senbet, Allied Social Sciences Association Annual Meeting, New York, December, 1985

"Security Market and Capital Structure Issues in U S -Japanese Economic Relations," Public Lecture at Osaka University, June, 1986

"International Capital Structure Equilibrium," with L. W. Senbet, presented at the 1987 Annual Meetings of the Western Finance Association (San Diego, June), the European Finance Association (Madrid, September), the Academy of International Business (Chicago, November), and the American Finance Association (Chicago, December)

"A Commentary on 'Japanese Capital Exports through Portfolio Investment in Foreign Securities,'" International Conference on Japanese Financial Growth, London, England, October, 1988

"Capital Structure and Cost of Capital in the U S and Japan," presented at the 1988 Annual Meeting of the Academy of International Business (San Diego, November) and the 1989 Annual Meeting of the Association of Japanese Business Studies (San Francisco, January). This paper was also presented at a symposium on Japanese Finance at the University of Michigan, January, 1989

"On Dumping at Less than Marginal Cost," Second Annual International Symposium on Pacific-Asian Business, Honolulu, January, 1989.

"Agency Problems and International Capital Structure," with L. W. Senbet, First Annual Pacific-Basin Finance Conference, Taipei, Taiwan, March, 1989

"Japanese Corporate Financing Patterns," Applied Securities Analysis Conference, University of Wisconsin-Madison, September, 1989.

"Is the Cost of Capital Lower in Japan?" Presented at the 1990 Annual Meeting of the Academy of International Business (Toronto, October) and the 1990 TIMS/ORSA Joint National Meeting (Philadelphia, October)

"Global Manufacturing Planning Models and Practices," TIMS/ORSA Joint National Meeting, Philadelphia, October, 1990.

"International Financial Structure and Competitiveness," 1991 International Conference on Economics and Management, Tokyo, Japan, March, 1991

"Cross-holding and Market Return Measures," with M. Fedenia and A. J. Triantis, presented at the 1991 Western Finance Association Annual Meeting (Jackson Lake Lodge, Wyoming, June), the 1991 TIMS/ORSA Joint National Meeting (Anaheim, November), and the Osaka University - Wharton Conference on Corporate Financial Policy and International Competition (Osaka, Japan, January, 1992)

"Multinationality and Capital Structure," with K. Singh, presented at TIMS/ORSA Joint National Meeting, Boston, April, 1994

"The Bubble Burst, Then Things Got Worse Perspectives on the Japanese Financial Crisis," with N Buchan and K Ito, presentation at the World Affairs and Global Economy (WAGE) workshop, University of Wisconsin-Madison, April, 1998.

"The Japanese Banking Crisis," presented at the U.S.-Asian Pacific Relations in the 21st Century Conference, St. Norbert College, De Pere, Wisconsin, October, 1998

"Default Risk with Managerial Control," with T. Zariphopoulou, presented at the Bachelier Finance Society Congress, Crete, June, 2002

"Incentive Contracts and Hedge Fund Management," with J. Jackwerth, presented at the Conference on Delegated Portfolio Management jointly sponsored by the University of Oregon and the Journal of Financial Economics (Eugene, Oregon, September 2004) and at the 2005 Frontiers of Finance conference (Bonaire, Netherlands Antilles, January 2005)

"Employee Stock Options Much More Valuable Than You Thought," with J. C. Jackwerth, presented at the 15th Annual Derivative Securities and Risk Management Conference (Arlington, Virginia, April 2005), at the 2005 FMA European Conference (Siena, Italy, June), and at the 2006 Frontiers of Finance conference (Bonaire, Netherlands Antilles, January 2006)

Testimony

Wisconsin Power and Light Company vs. Union Pacific Railroad Company, Surface Transportation Board, Verified Rebuttal Statement, September 2000

PPL Montana, LLC vs. Burlington Northern and Santa Fe Railway Company, Surface Transportation Board, Verified Rebuttal Statement, April 2001

Xcel Energy vs. United States Government, Expert Report (March), Rebuttal Report (May), Deposition (June), 2006

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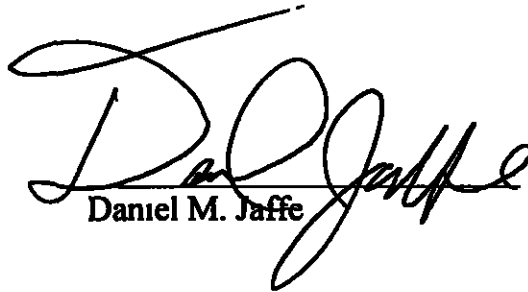
Professional Societies

Academy of International Business
American Finance Association
Financial Management Association
Global Association of Risk Professionals
Professional Risk Managers' International Association
Society for Financial Studies
Western Finance Association

CERTIFICATE OF SERVICE

I hereby certify that on this 5th day of September 2008, I caused a copy of the foregoing Reply Fourth Supplemental Evidence of Complainant AEP Texas North Company to be served by hand delivery on counsel for BNSF, as follows:

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